

WHAT IS CLAIMED IS:

1. A DNA encoding a protein having a neoxanthin cleavage activity for improving stress tolerance in a plant.
- 5 2. A DNA for reducing stress tolerance in a plant, wherein the DNA is selected from the group consisting of:
 - (a) a DNA encoding an antisense RNA complementary to a transcript of a gene encoding a protein having a neoxanthin cleavage activity;
 - (b) a DNA encoding an RNA comprising a ribozyme activity which 10 cleaves a transcript of a gene encoding a protein having a neoxanthin cleavage activity; and
 - (c) a DNA encoding an RNA which inhibits the expression of a gene encoding a protein having a neoxanthin cleavage activity in a plant cell by the cosuppression effect.
- 15 3. The DNA of claims 1 or 2, wherein the protein having a neoxanthin cleavage activity is selected from the group consisting of:
 - (a) a protein comprising an amino acid sequence of SEQ ID NOS: 2, 6, 10, 12, 14, or 16;
 - (b) a protein comprising an amino acid sequence in which one or 20 more amino acids in SEQ ID NOS: 2, 6, 10, 12, 14, or 16 are replaced, deleted, added, and/or inserted; and
 - (c) a protein encoded by a DNA which hybridizes with a DNA comprising a nucleotide sequence of SEQ ID NOS: 1, 5, 9, 11, 13, 25 or 15 under the stringent condition.
4. The DNA of any one of claims 1 to 3, wherein the protein having a neoxanthin cleavage activity is derived from *Arabidopsis* plants.
- 30 5. A transformant plant cell carrying the DNA of any one of claims 1 to 4.
6. A transgenic plant comprising the transformant plant cell of claim 5.
7. A transgenic plant which is offspring or a clone of the transformant plant of claim 6.
- 35 8. The transgenic plant of claims 6 or 7, wherein the expression of a gene encoding a protein having a neoxanthin

cleavage activity is increased or decreased compared with its wild type.

9. The transgenic plant of any one of claims 6 to 8, wherein the amount of abscisic acid is increased or decreased compared 5 with its wild type.

10. The transgenic plant of any one of claims 6 to 9, wherein stress tolerance is increased or decreased compared with its wild type.

11. A propagation material for the transgenic plant of any 10 one of claims 6 to 10.

12. A vector comprising the DNA of any one of claims 1 to 4.

13. A method for producing the transgenic plant of any one of claims 6 to 10, comprising the steps of introducing a DNA of 15 any one of claims 1 to 4 into a plant cell and regenerating a plant from the plant cell.

14. A method for increasing or decreasing stress tolerance in a plant, comprising expressing the DNA of any one of claims 1 to 4 in a plant cell.